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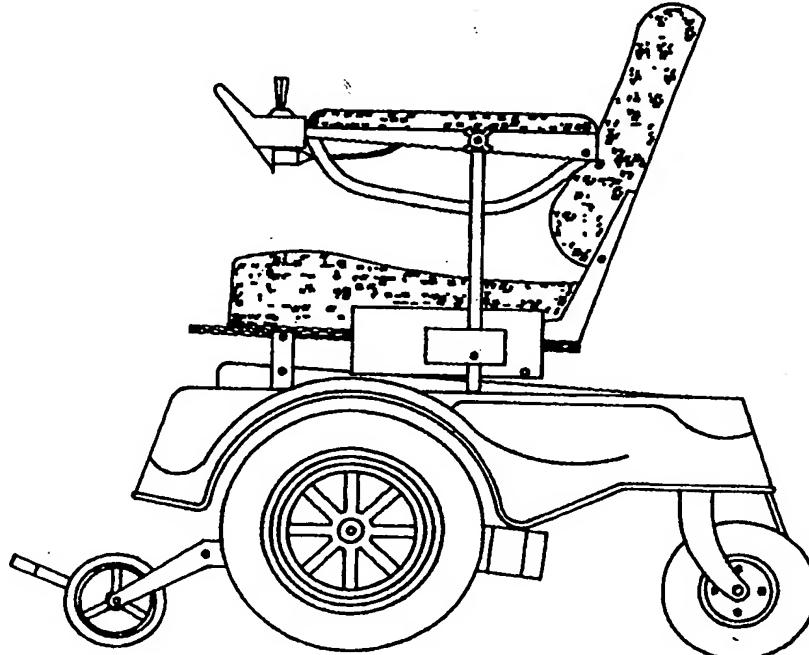
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

|   |  |    |  |
|---|--|----|--|
| (51) International Patent Classification 6 :<br><br>A61G 5/04   |  | A1 | (11) International Publication Number: <b>WO 99/17701</b><br><br>(43) International Publication Date: 15 April 1999 (15.04.99)   |
| (21) International Application Number: PCT/US98/20903   |  |    | (81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). |
| (22) International Filing Date: 5 October 1998 (05.10.98)   |  |    |  |
| (30) Priority Data:<br>60/061,120 6 October 1997 (06.10.97) US  |  |    |  |
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(54) Title: FOLDABLE POWER WHEELCHAIR

## (57) Abstract

A power chair comprising: a frame transversely foldable between operating and transport positions, a seat connected to said frame, a pair of drive wheels connected to said frame and rotatable about transverse axes below a portion of said seat supporting an occupant's thighs, motors for driving respective drive wheels, respective motor/drive wheel combinations being pivotally connected to said frame, one ground-engaging idler wheel connected to said frame and located rearward of said drive wheels and one anti-tip wheel forward of said drive wheels and positioned above ground, connected to said frame for movement relative to said frame upon encountering an obstacle.



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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

PCT/NO 01/00217

| Patent document cited in search report | Publication date | Patent family member(s)  | Publication date |  |
|--|------------------|--|------------------|--|
| US 4210859 A                           | 01/07/80         | NONE   |                  |  |
| US 4393157 A                           | 12/07/83         | BR 7906797 A 17/06/80<br>CA 1118509 A 16/02/82<br>DE 2967481 D 00/00/00<br>DE 2967589 D 00/00/00<br>DE 2967595 D 00/00/00<br>EP 0010502 A,B 30/04/80<br>SE 0010502 T3<br>EP 0106371 A,B 25/04/84<br>SE 0106371 T3<br>EP 0109096 A,B 23/05/84<br>SE 0109096 T3<br>JP 1315732 C 15/05/86<br>JP 55056608 A 25/04/80<br>JP 60040171 B 10/09/85 |                  |  |

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/NO 01/00217

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G05F 1/32, H01F 29/14

According to International Patent Classification (IPC) or to both national classification and IPC

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Minimum documentation searched (classification system followed by classification symbols)

IPC7: G05F, H01F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|----------|---|-----------------------|
| X        | US 4210859 A (PAUL L. MERETSKY ET AL), 1 July 1980<br>(01.07.80), column 3, line 51 - column 5, line 27;<br>column 13, line 7 - line 17, abstract<br>--   | 1-40                  |
| A        | SU 441601 A (KRZHIZHANOVSKII POW) 1975-06-05<br>(abstract) World Patents Index (online).<br>London, U.K.: Derwent Publications, Ltd.<br>(retrieved on 2001-08-27). Retrieved from<br>EPO WPI database. DW 197547, Accession No.<br>1975-M5963W<br>see abstract and figure<br>-- | 1-40                  |

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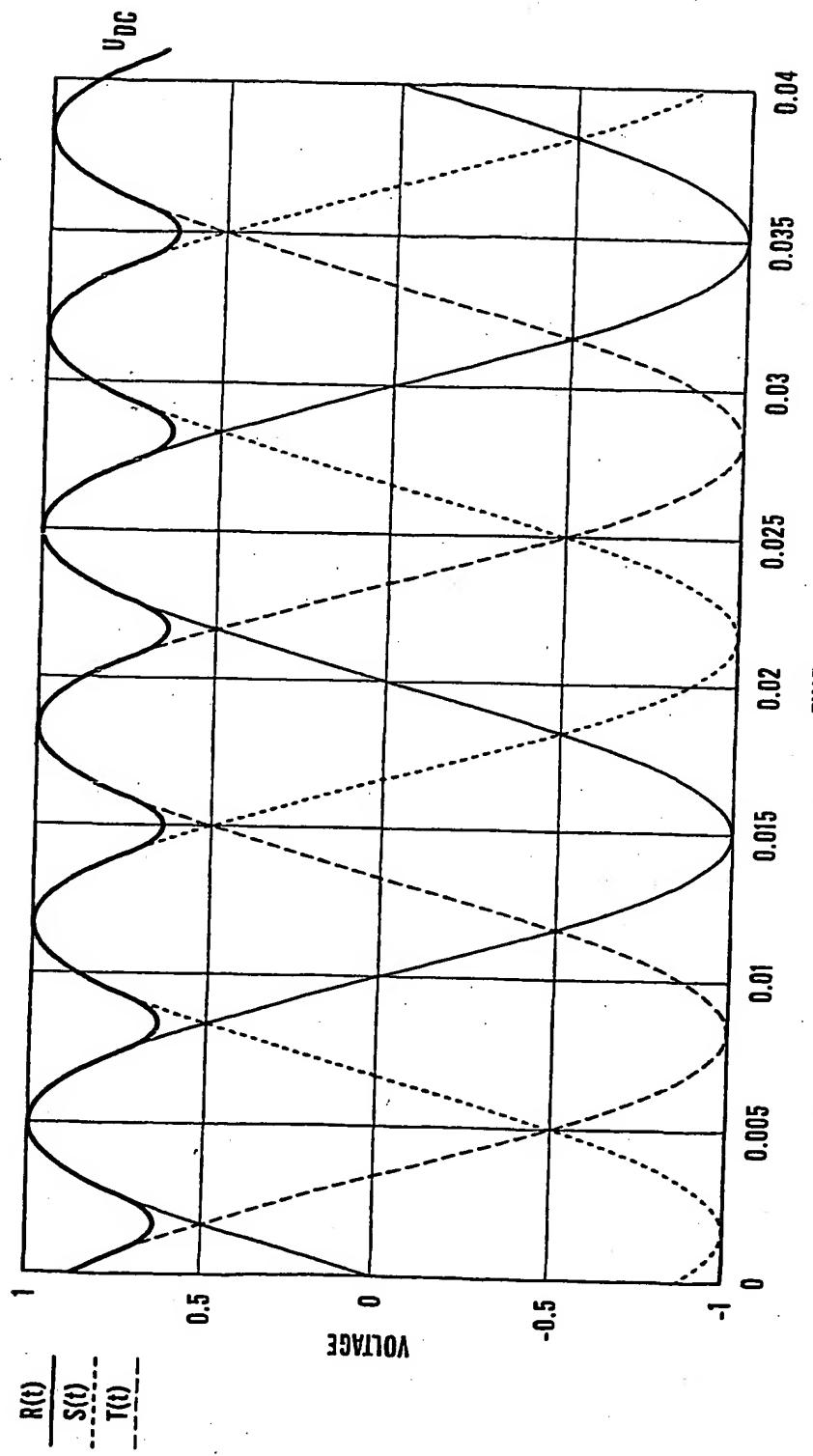


Fig. 71a

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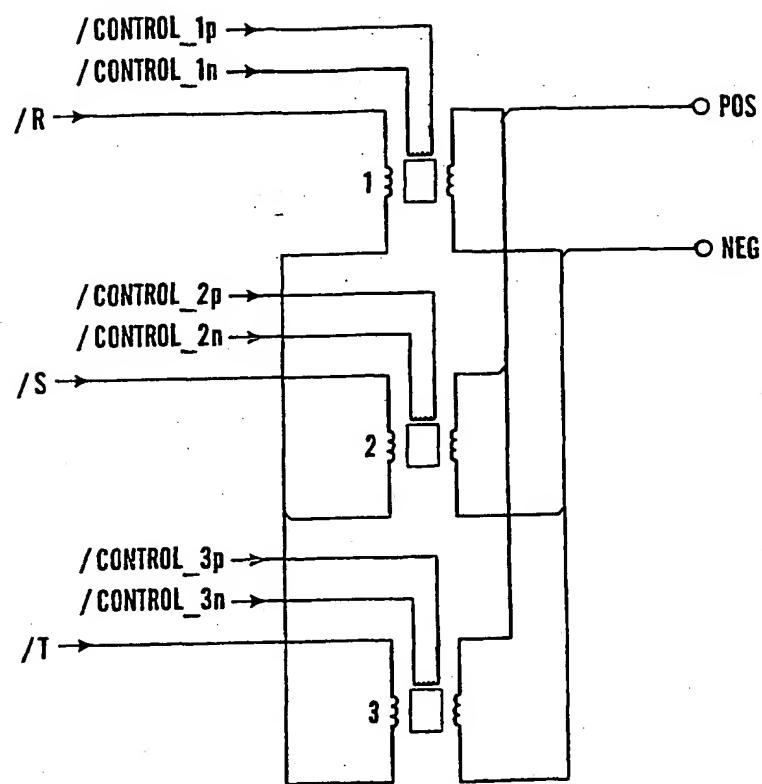


Fig.71

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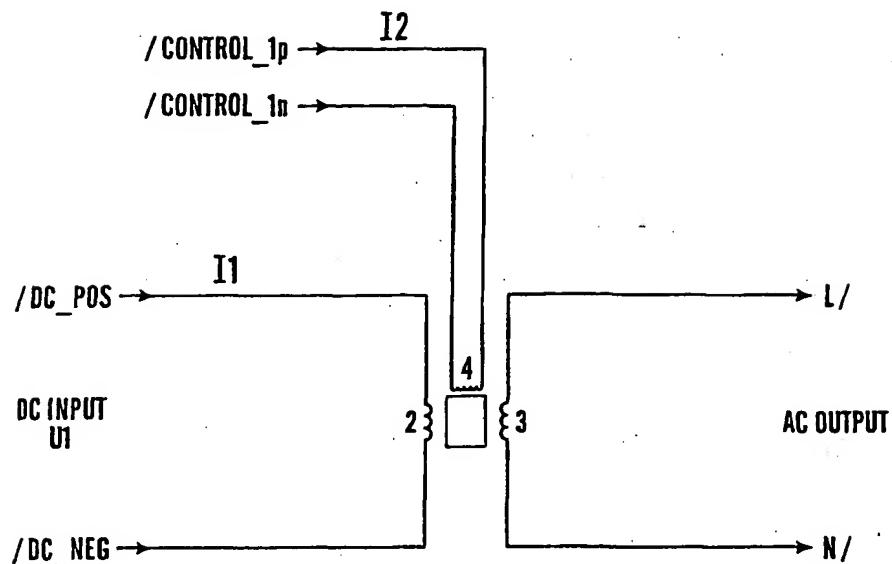


Fig.70

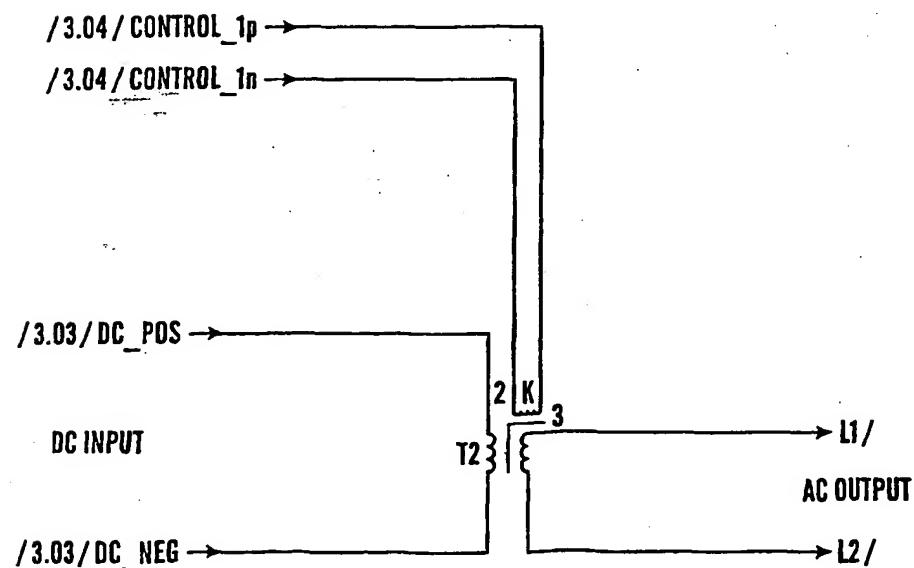


Fig.70a

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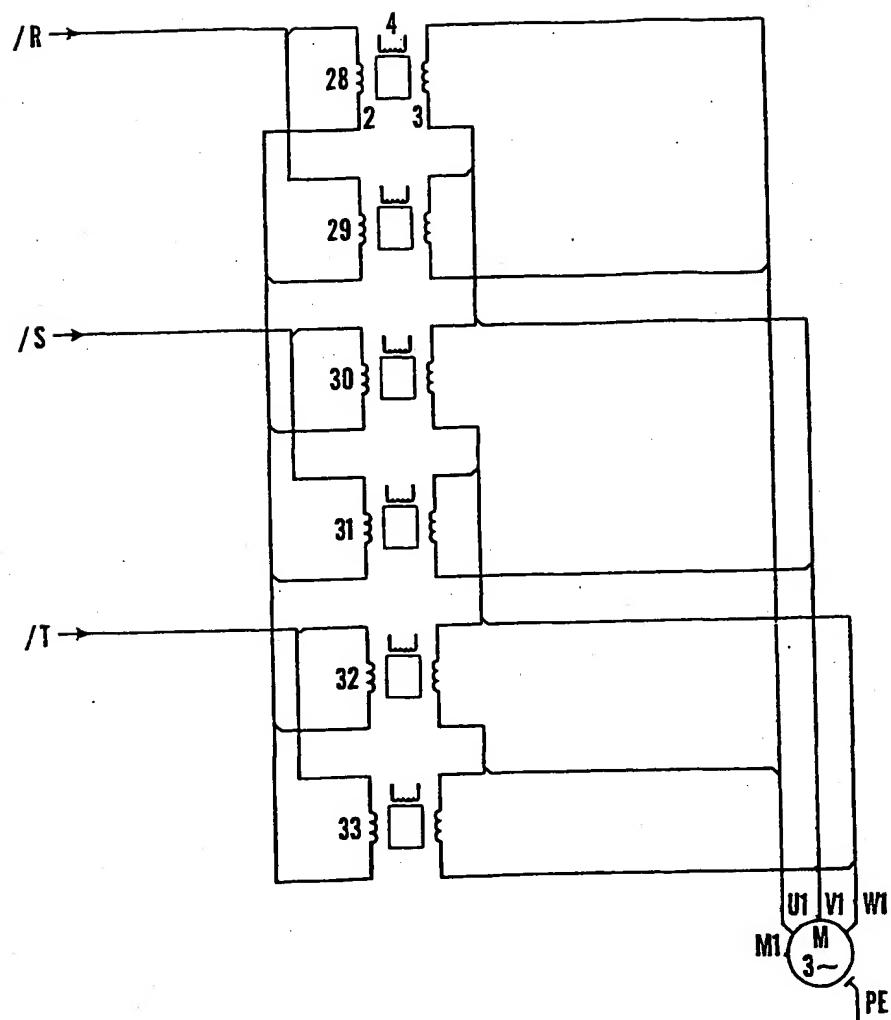
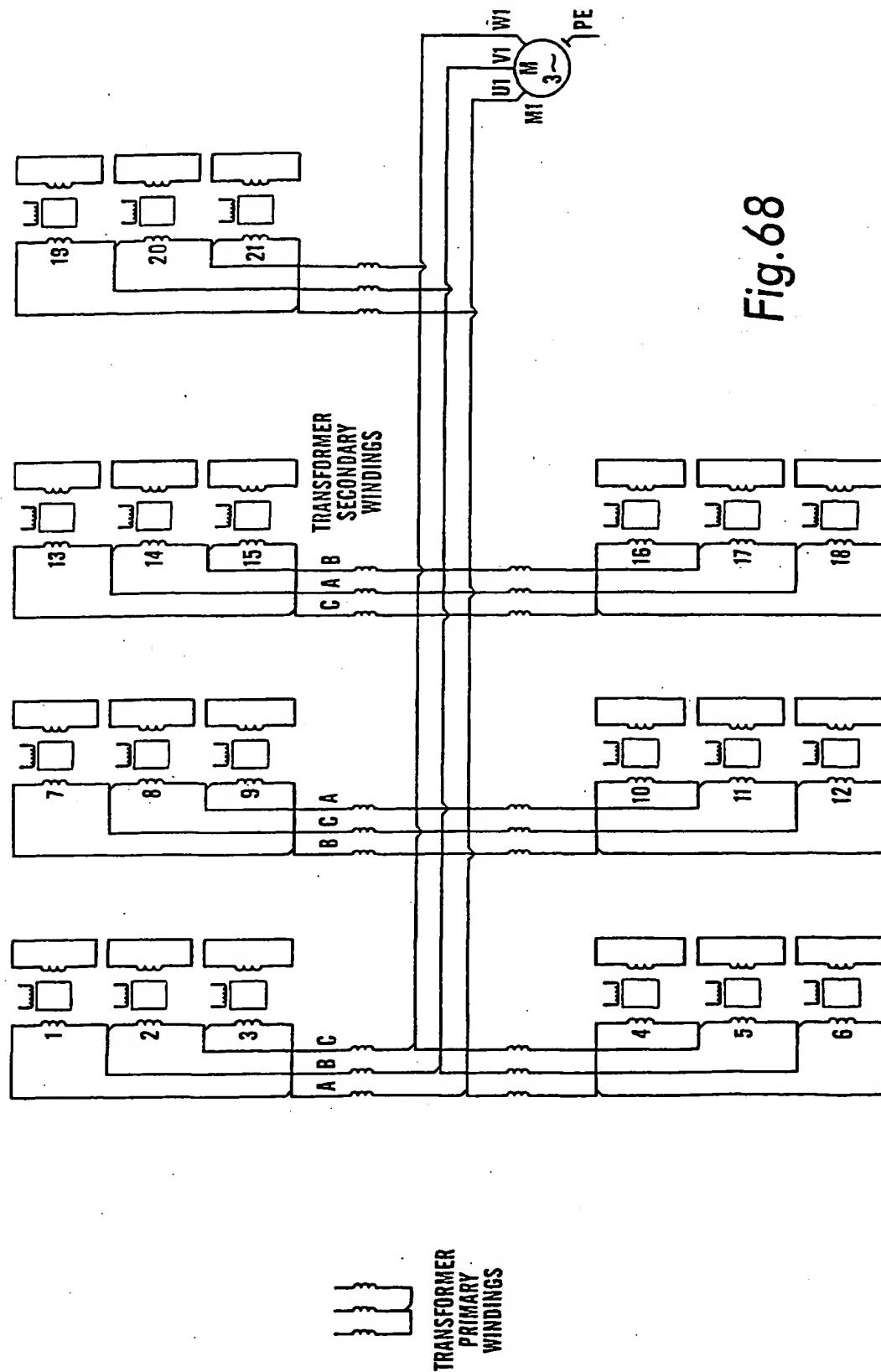


Fig.69

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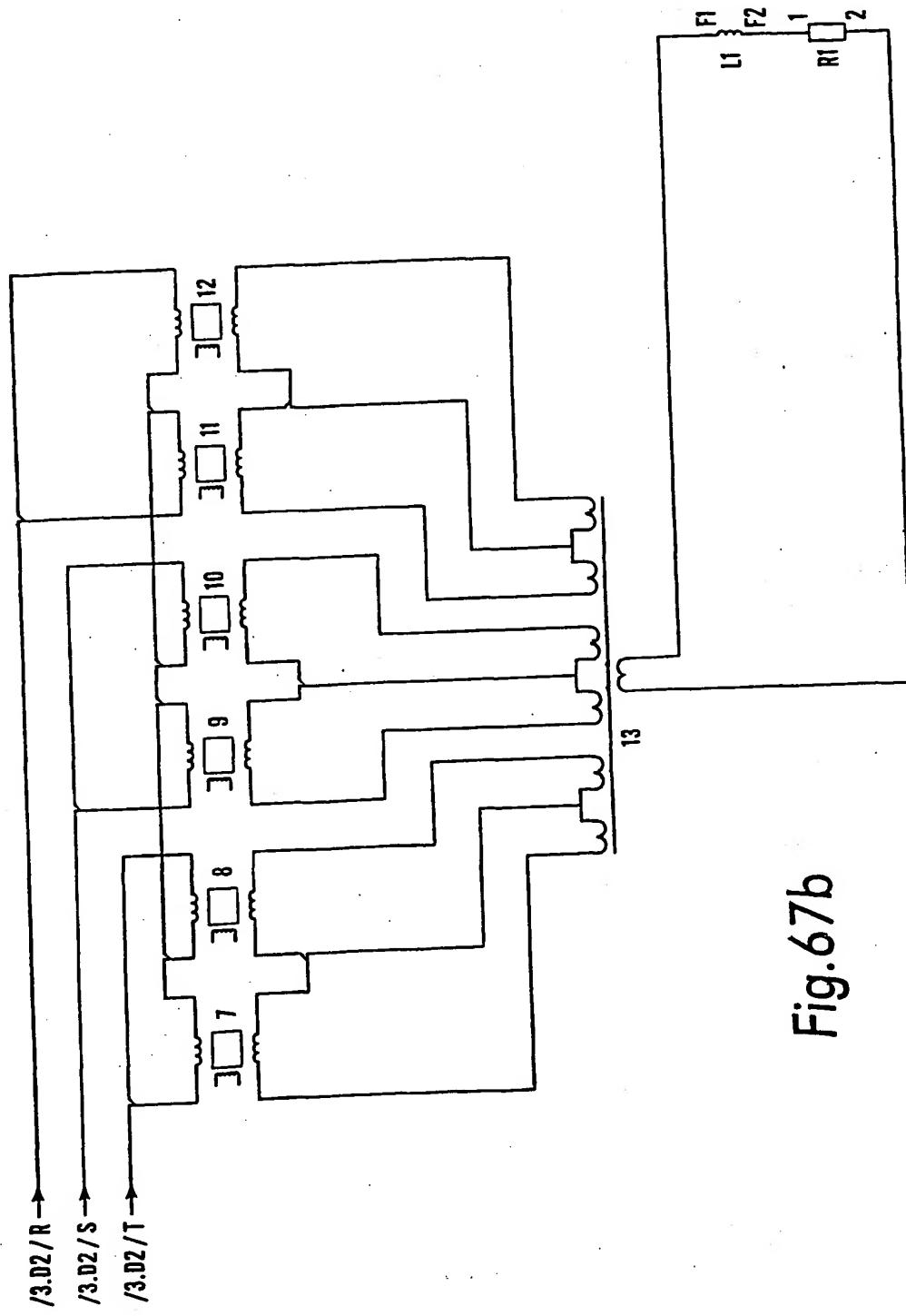


Fig.67b

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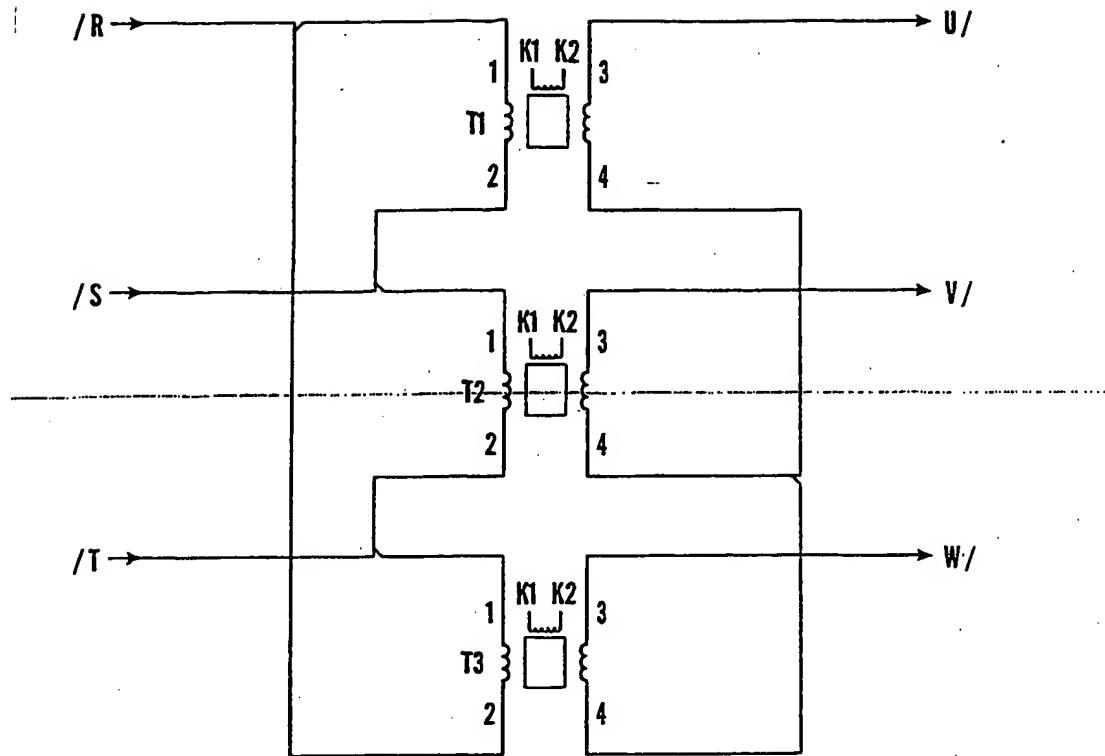


Fig.67

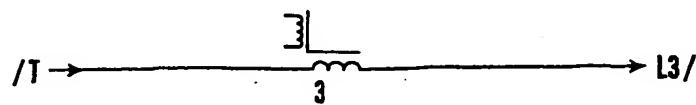
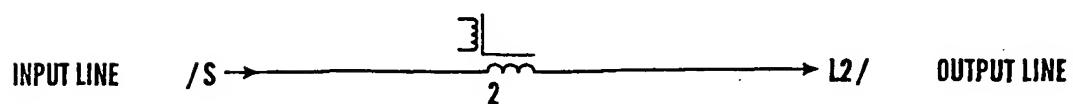
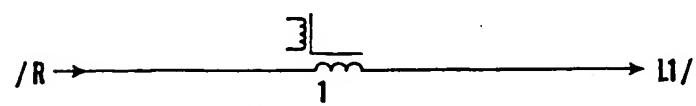


Fig.67a

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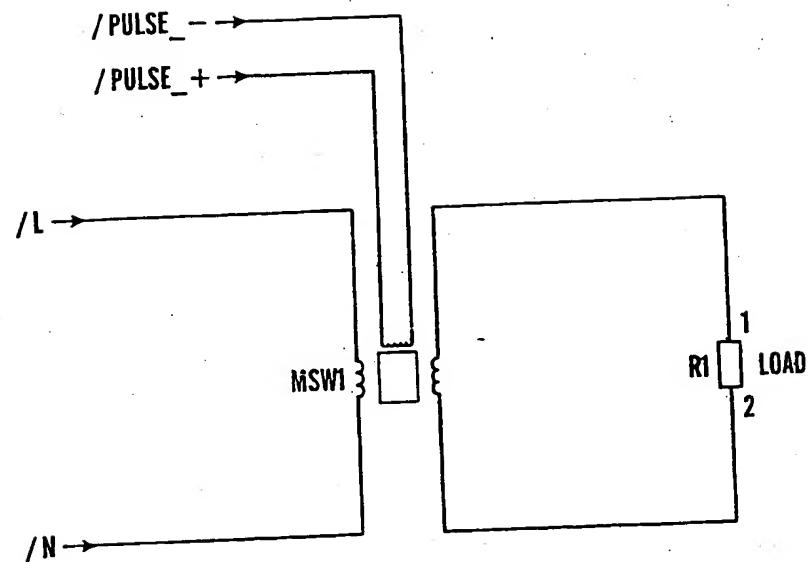


Fig.66

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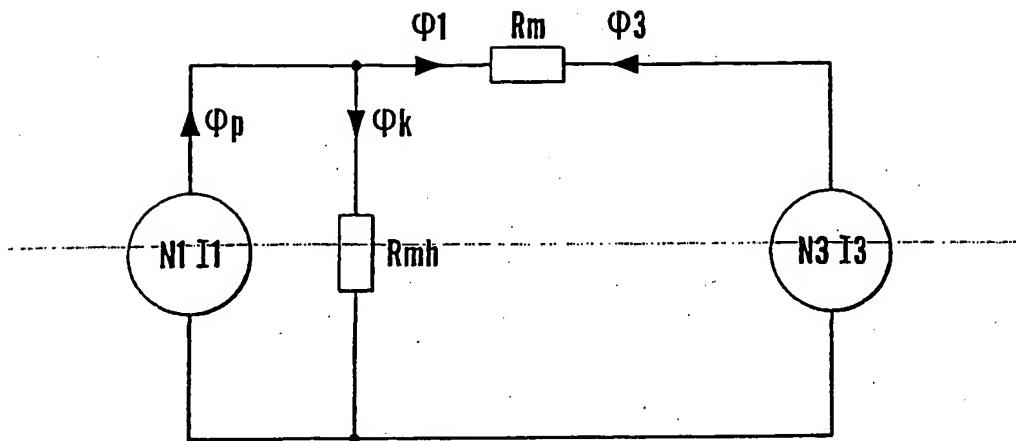


Fig.65a

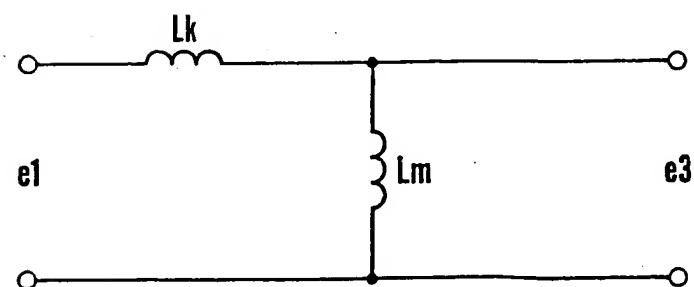


Fig.65b

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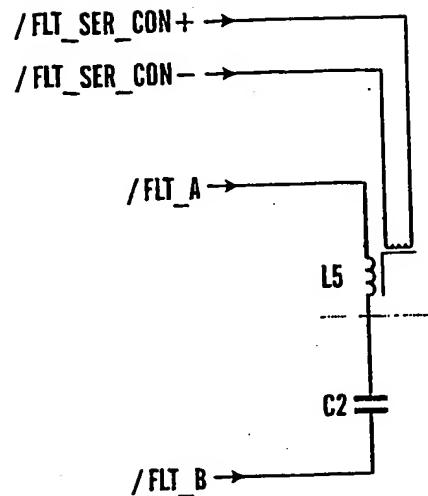


Fig.64a

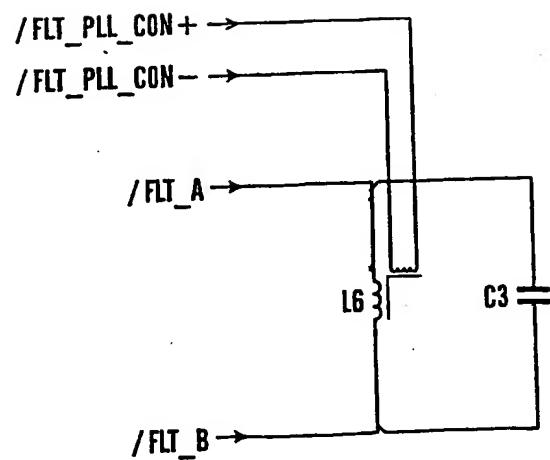


Fig.64b

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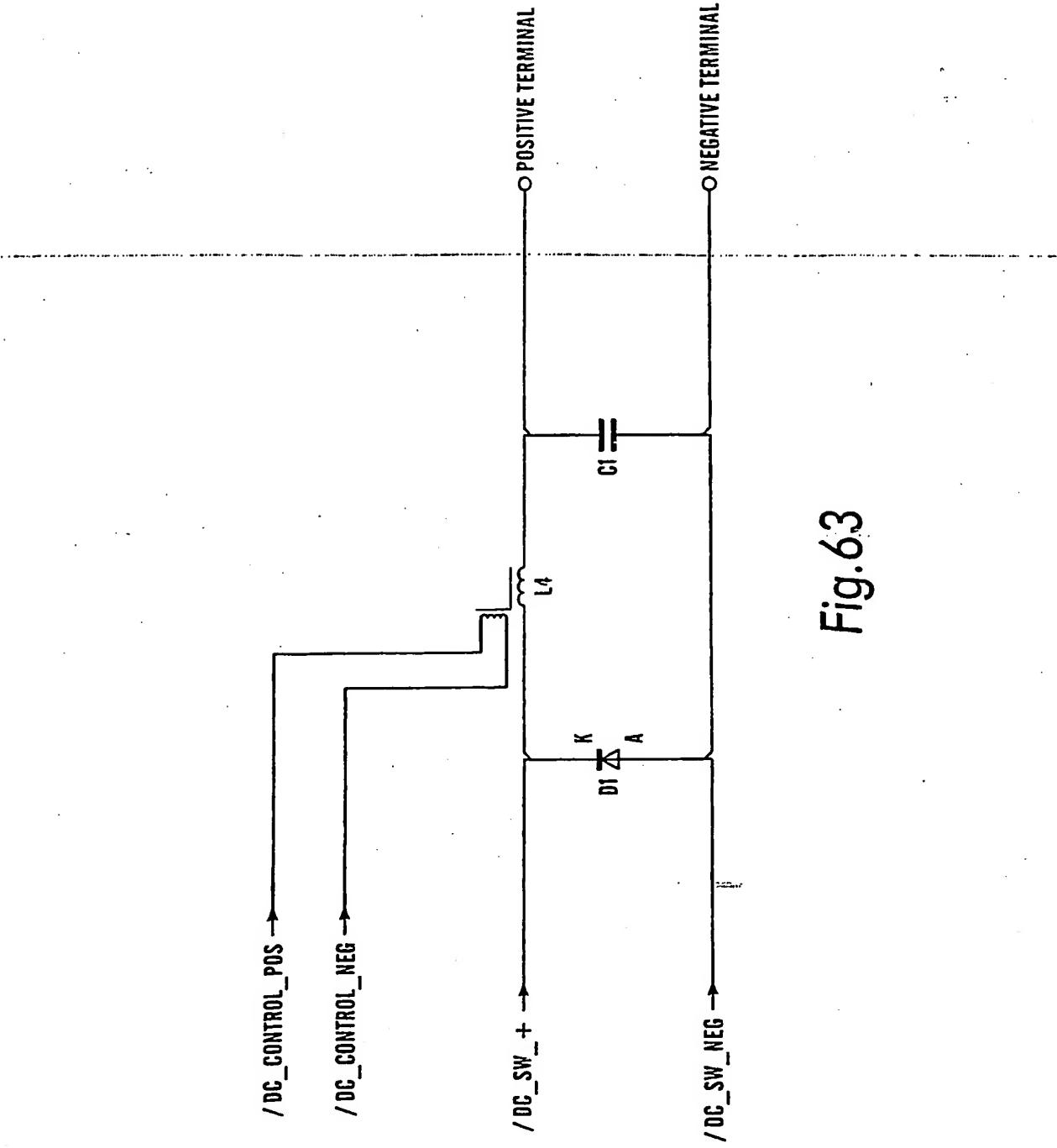


Fig.63

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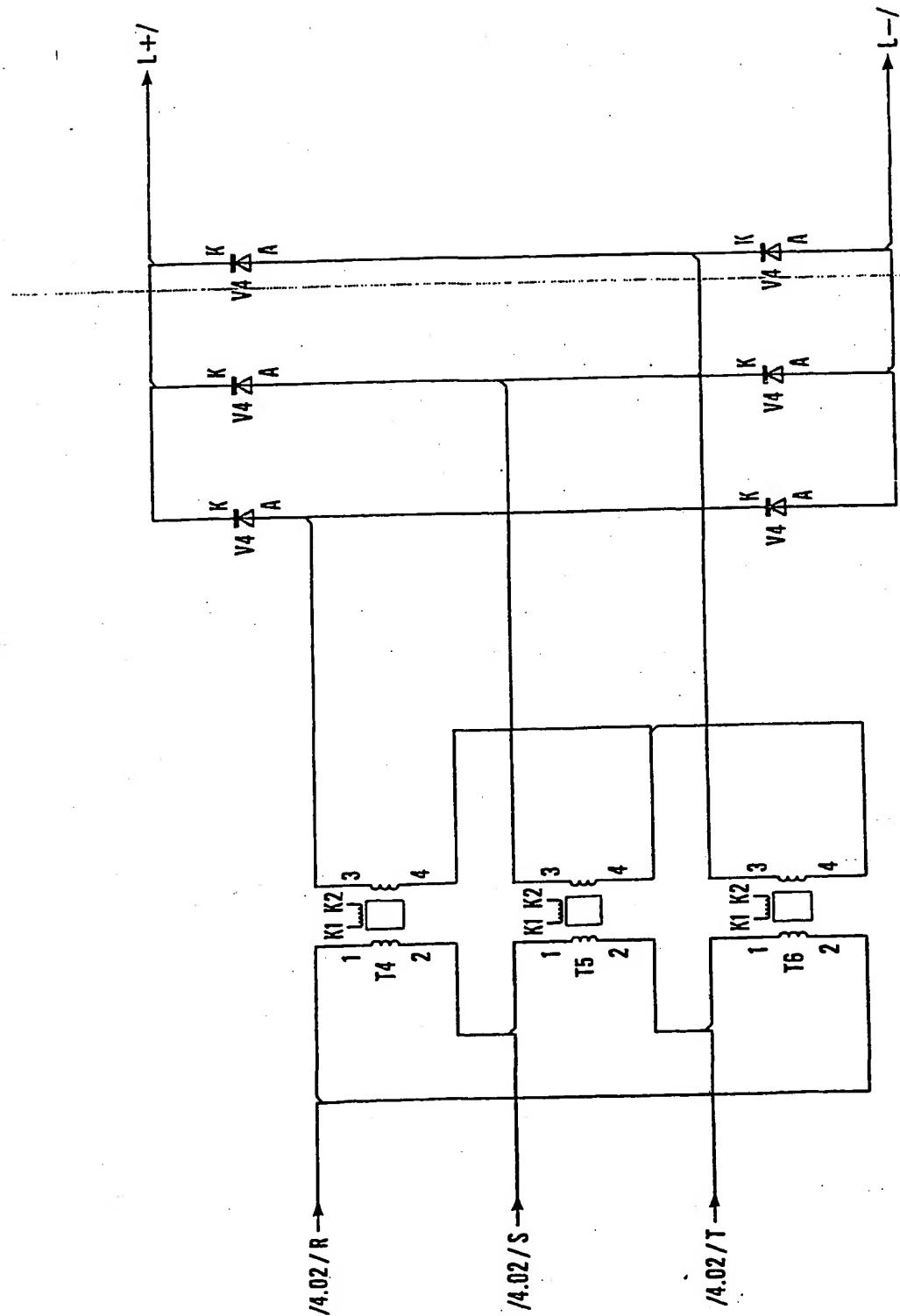


Fig.62a

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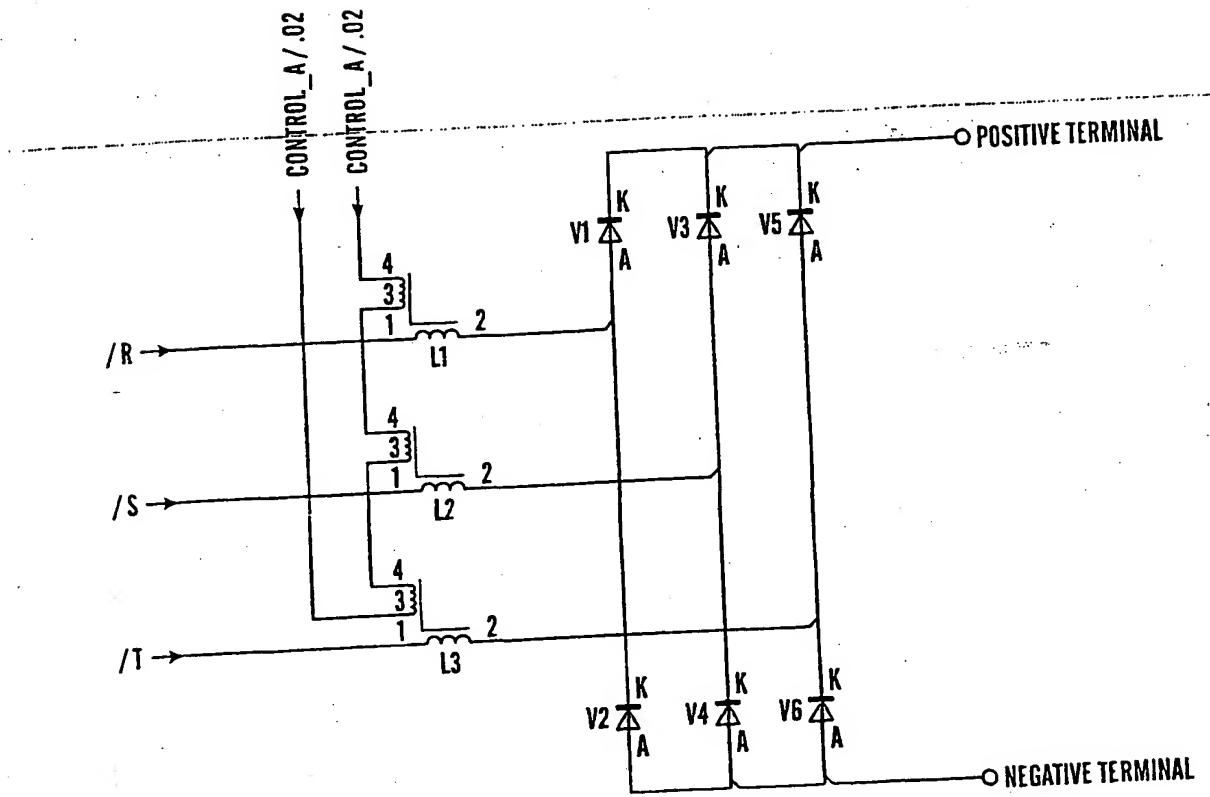


Fig.62

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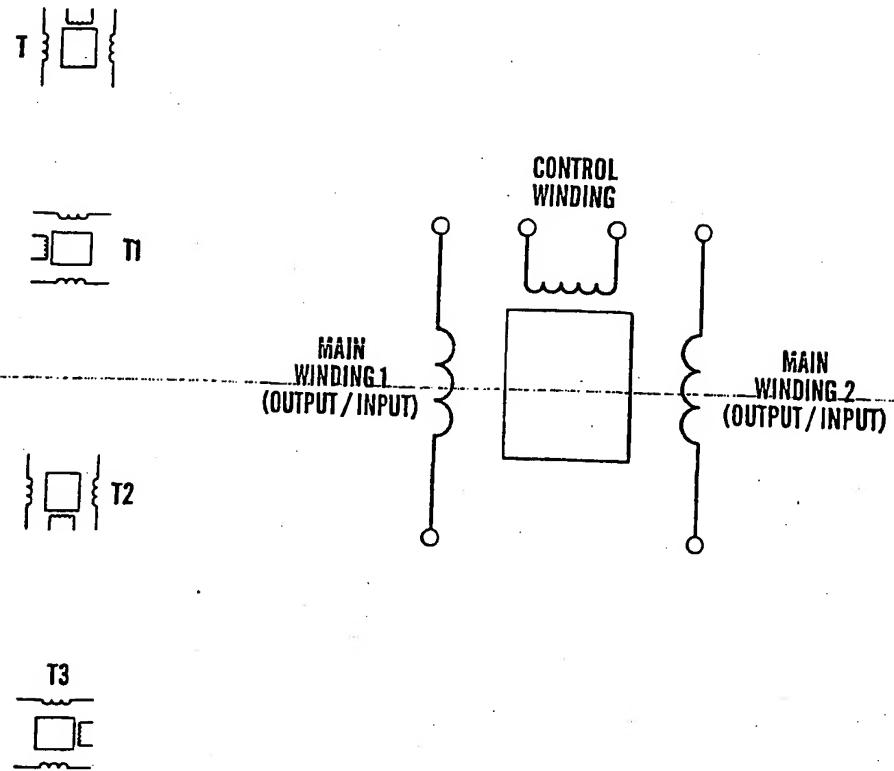


Fig.60

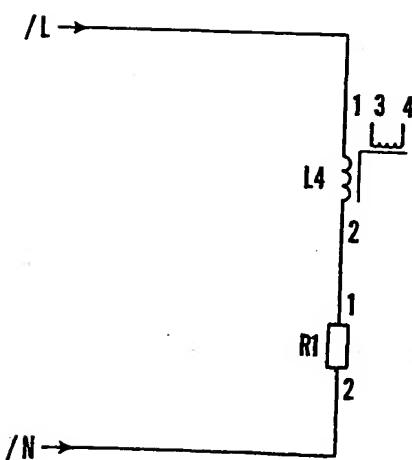


Fig.61

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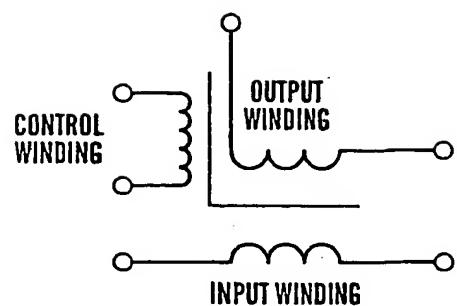


Fig.59

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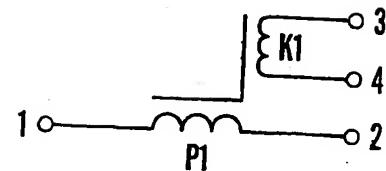


Fig.56

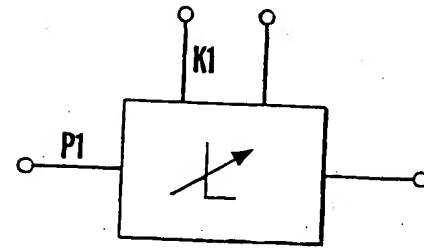


Fig.57

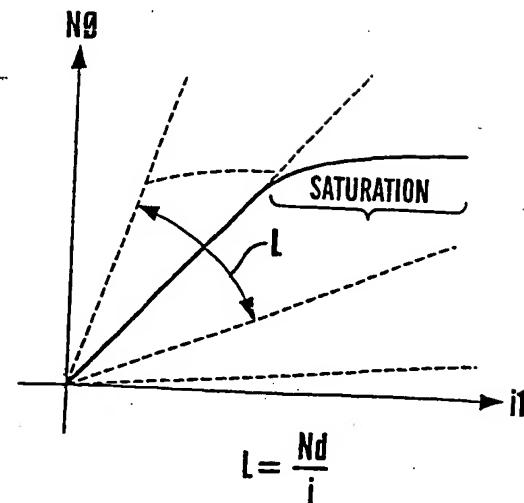
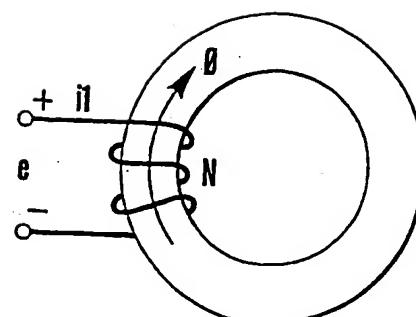


Fig.58

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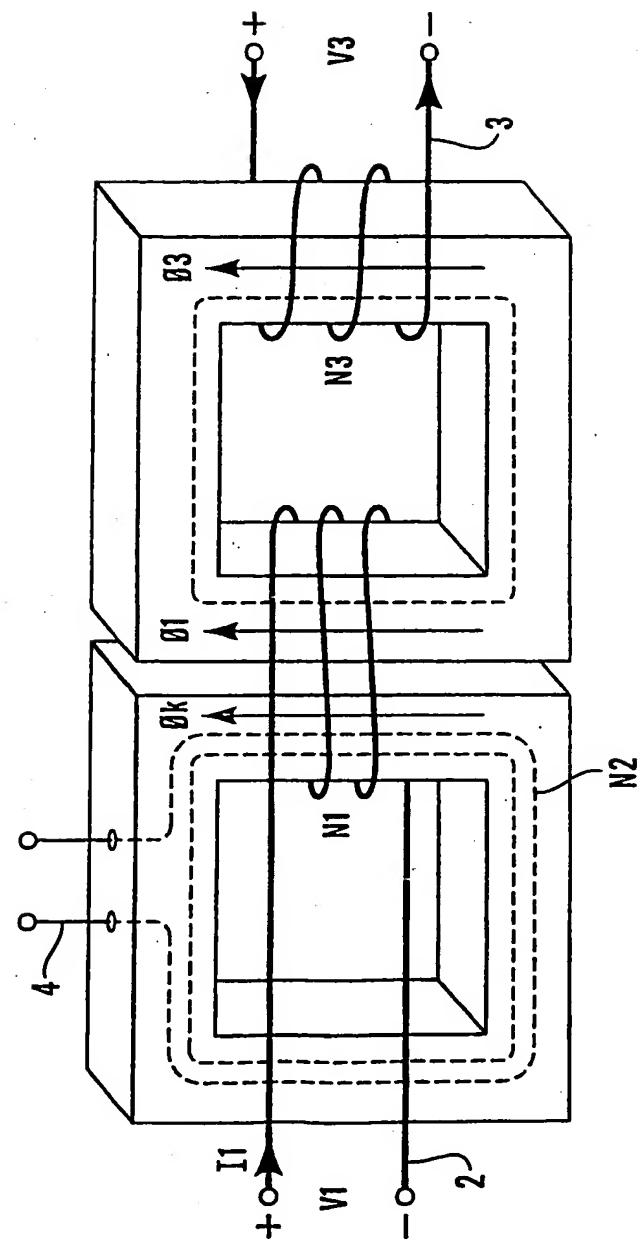


Fig.55

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Fig.54

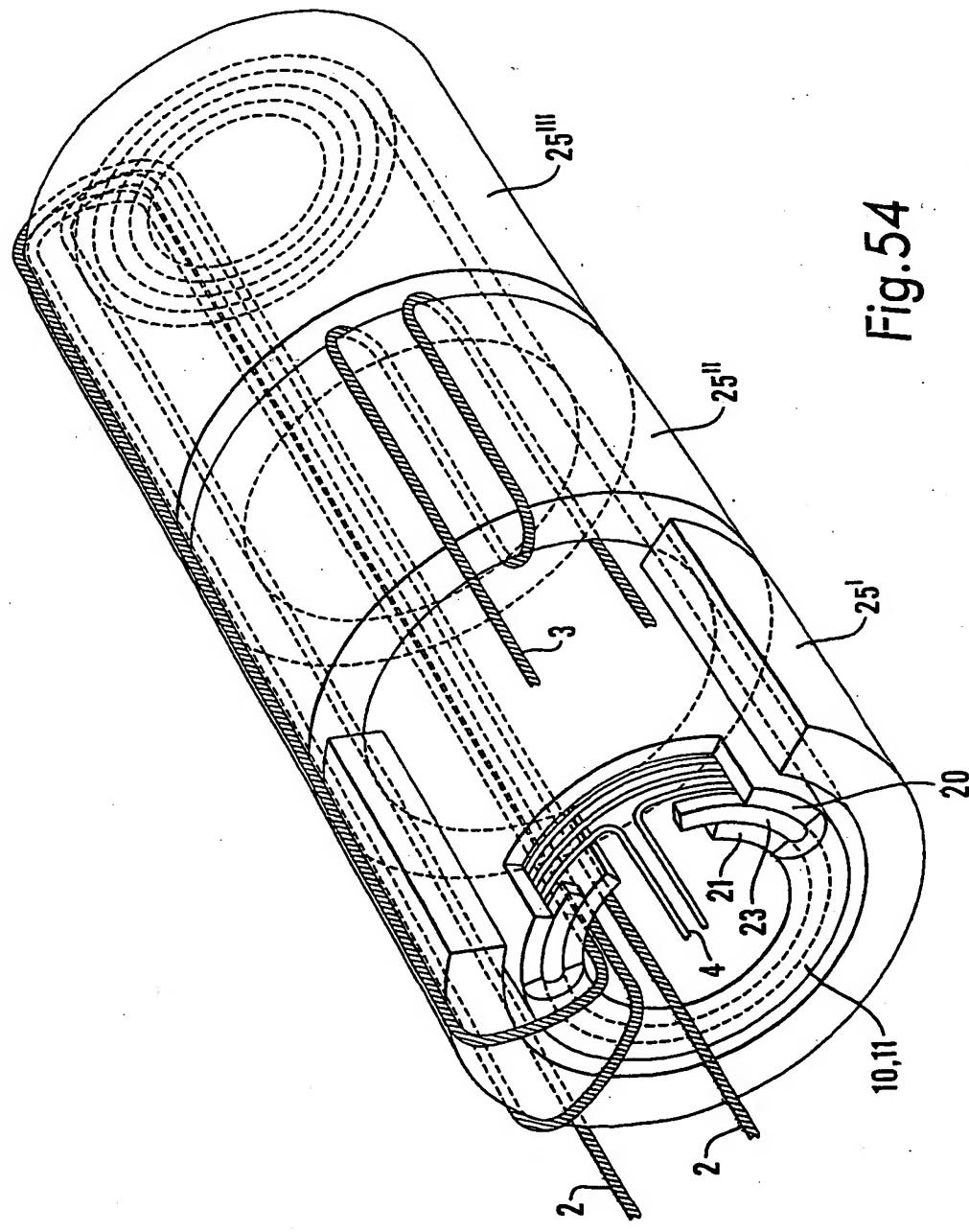


TABLE 2

| Compound No. | Physicochemical Characteristics  |
|--------------|--|
| A-1          | Appearance: Light yellow liquid<br>IR (cm <sup>-1</sup> ) : 3450, 3290, 1690                       |
| A-2          | Appearance: Colorless crystal<br>m.p. (°C) : 101-103<br>IR (cm <sup>-1</sup> ) : 3420, 3300, 1680  |
| A-3          | Appearance: Light yellow crystal<br>m.p. (°C) : 75-77<br>IR (cm <sup>-1</sup> ) : 3410, 3310, 1670 |
| A-4          | Appearance: Light yellow crystal<br>m.p. (°C) : 96-98<br>IR (cm <sup>-1</sup> ) : 3450, 3300, 1680 |
| A-5          | Appearance: Colorless crystal<br>m.p. (°C) : 146-148<br>IR (cm <sup>-1</sup> ) : 3450, 3290, 1680  |
| A-6          | Appearance: Light brown liquid<br>IR (cm <sup>-1</sup> ) : 3440, 3300, 1675                        |
| A-7          | Appearance: Colorless crystal<br>m.p. (°C) : 132-134<br>IR (cm <sup>-1</sup> ) : 3450, 3370, 1665  |
| A-8          | Appearance: Yellow crystal<br>m.p. (°C) : 72-74<br>IR (cm <sup>-1</sup> ) : 3440, 3320, 1680       |
| A-9          | Appearance: Colorless crystal<br>m.p. (°C) : 87-89<br>IR (cm <sup>-1</sup> ) : 3400, 3290, 1670    |
| A-10         | Appearance: Light brown crystal<br>m.p. (°C) : 80-82<br>IR (cm <sup>-1</sup> ) : 3450, 3280, 1680  |
| A-11         | Appearance: Light brown liquid<br>IR (cm <sup>-1</sup> ) : 3450, 3170, 1680                        |

5 TABLE 2 (Continued)

| Compound No. | Physicochemical Characteristics   |
|--------------|---|
| 10 A-12      | Appearance: Colorless crystal<br>m.p. (°C) : 103-105<br>IR (cm <sup>-1</sup> ) : 3440, 3160, 1680       |
| 15 A-13      | Appearance: Light brown liquid<br>: IR (cm <sup>-1</sup> ) : 3450, 3160, 1680                           |
| 20 A-14      | Appearance: Light brown crystal<br>m.p. (°C) : 68-70<br>IR (cm <sup>-1</sup> ) : 3450, 3300, 1690       |
| 25 A-15      | Appearance: Light brown crystal<br>m.p. (°C) : 140-141<br>IR (cm <sup>-1</sup> ) : 3450, 3130, 1690     |
| 30 A-16      | Appearance: Light brown liquid<br>: IR (cm <sup>-1</sup> ) : 3450, 3260, 1680                           |
| 35 A-17      | Appearance: Light yellow liquid<br>: IR (cm <sup>-1</sup> ) : 3450, 3290, 1690                          |
| 40 A-18      | Appearance: Light red brown crystal<br>m.p. (°C) : 108-110<br>IR (cm <sup>-1</sup> ) : 3440, 3375, 1670 |
| 45 A-19      | Appearance: Light brown liquid<br>: IR (cm <sup>-1</sup> ) : 3450, 3290, 1675                           |
| A-20         | Appearance: Light brown liquid<br>: IR (cm <sup>-1</sup> ) : 3440, 3360, 1670                           |
| A-21         | Appearance: Light brown liquid<br>: IR (cm <sup>-1</sup> ) : 3450, 3310, 1690                           |
| A-22         | Appearance: Colorless crystal<br>m.p. (°C) : 50-52<br>IR (cm <sup>-1</sup> ) : 3450, 3290, 1690         |

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55

TABLE 2 (Continued)

| 5  | Compound No. | Physicochemical Characteristics  |
|----|--------------|--|
| 10 | A-23         | Appearance: Light yellow liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3300, 1690  |
| 15 | A-24         | Appearance: Light yellow crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 108-110<br>IR ( $\text{cm}^{-1}$ ) : 3470, 3300, 1670      |
| 20 | A-25         | Appearance: Light brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3160, 1680   |
| 25 | A-26         | Appearance: Colorless crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 130-132<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3175, 1685         |
| 30 | A-27         | Appearance: Light brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3160, 1680   |
| 35 | A-28         | Appearance: Light brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3170, 1685   |
| 40 | A-29         | Appearance: Light brown crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 66-68<br>IR ( $\text{cm}^{-1}$ ) : 3430, 3300, 1670         |
| 45 | A-30         | Appearance: Light brown crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 180-182<br>IR ( $\text{cm}^{-1}$ ) : 3420, 3300, 1690, 1665 |
| 50 | A-31         | Appearance: Colorless crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 129-131<br>IR ( $\text{cm}^{-1}$ ) : 3460, 3230, 1700, 1670   |
| 55 | A-32         | Appearance: Light brown crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 129-131<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3300, 1675       |
| 60 | A-33         | Appearance: Light brown crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 168-170<br>IR ( $\text{cm}^{-1}$ ) : 3480, 3300, 1710, 1670 |

TABLE 2 (Continued)

| 5  | Compound No. | Physicochemical Characteristics   |
|----|--------------|---|
| 10 | A-34         | Appearance: Colorless crystal<br>m.p. (°C) : 130-132<br>IR (cm <sup>-1</sup> ) : 3450, 3130, 1690       |
| 15 | A-35         | Appearance: Light brown crystal<br>m.p. (°C) : 155-157<br>IR (cm <sup>-1</sup> ) : 3450, 3125, 1690     |
| 20 | A-36         | Appearance: Colorless crystal<br>m.p. (°C) : 92-94<br>IR (cm <sup>-1</sup> ) : 3470, 3240, 1715, 1675   |
| 25 | A-37         | Appearance: Colorless crystal<br>m.p. (°C) : 86-88<br>IR (cm <sup>-1</sup> ) : 3450, 3290, 1675         |
| 30 | A-38         | Appearance: Colorless crystal<br>m.p. (°C) : 96-98<br>IR (cm <sup>-1</sup> ) : 3470, 3270, 1710, 1670   |
| 35 | A-39         | Appearance: Light brown crystal<br>m.p. (°C) : 117-119<br>IR (cm <sup>-1</sup> ) : 3380, 3230, 1680     |
| 40 | A-40         | Appearance: Colorless crystal<br>m.p. (°C) : 174-176<br>IR (cm <sup>-1</sup> ) : 3450, 3240, 1710, 1675 |
| 45 | A-41         | Appearance: Colorless crystal<br>m.p. (°C) : 74-76<br>IR (cm <sup>-1</sup> ) : 3450, 3300, 1675         |
| 50 | A-42         | Appearance: Colorless crystal<br>m.p. (°C) : 147-149<br>IR (cm <sup>-1</sup> ) : 3475, 3310, 1715, 1670 |
| 55 | A-43         | Appearance: Light yellow liquid<br>IR (cm <sup>-1</sup> ) : 3460, 3300, 1675                            |
| 55 | A-44         | Appearance: Light yellow crystal<br>m.p. (°C) : 81-83<br>IR (cm <sup>-1</sup> ) : 3400, 3300, 1675      |

TABLE 2 (Continued)

| 5  | Compound No. | Physicochemical Characteristics  |
|----|--------------|--|
| 10 | A-45         | Appearance: Light brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3460, 3275, 1680   |
| 15 | A-46         | Appearance: Light brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3460, 3300, 1680   |
| 20 | A-47         | Appearance: Light brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3400, 3300, 1680   |
| 25 | A-48         | Appearance: Colorless liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3300, 1730, 1670   |
| 30 | A-49         | Appearance: Light brown crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 132-134<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3290, 1700, 1675 |
| 35 | A-50         | Appearance: Light brown crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 73-75<br>IR ( $\text{cm}^{-1}$ ) : 3400, 3310, 1680, 1665   |
| 40 | A-51         | Appearance: Light brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3170, 1680   |
| 45 | A-52         | Appearance: Brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3270, 1690   |
| 50 | A-53         | Appearance: Light brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3200, 1680   |
| 55 | A-54         | Appearance: Colorless crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 97-98<br>IR ( $\text{cm}^{-1}$ ) : 3360, 3250, 1670           |
|    | A-55         | Appearance: Light brown crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 120-122<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3300, 1675       |

TABLE 2 (Continued)

| 5  | Compound No. | Physicochemical Characteristics  |
|----|--------------|--|
| 10 | A-56         | Appearance: Light brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3300, 1690   |
| 15 | A-57         | Appearance: Light brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3280, 1680   |
| 20 | A-58         | Appearance: Colorless crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 79-81<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3300, 1700         |
| 25 | A-59         | Appearance: Brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3170, 1685   |
| 30 | A-60         | Appearance: Colorless crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 139-141<br>IR ( $\text{cm}^{-1}$ ) : 3470, 3210, 1705, 1670 |
| 35 | A-61         | Appearance: Colorless crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 106-108<br>IR ( $\text{cm}^{-1}$ ) : 3475, 3230, 1710, 1665 |
| 40 | A-62         | Appearance: Light brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3170, 1670   |
| 45 | A-63         | Appearance: Brown liquid<br>IR ( $\text{cm}^{-1}$ ) : 3450, 3170, 1685   |
|    | A-64         | Appearance: Light yellow crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 53-55<br>IR ( $\text{cm}^{-1}$ ) : 3440, 3225, 1670      |
|    | A-65         | Appearance: Light brown crystal<br>m.p. ( $^{\circ}\text{C}$ ) : 87-89<br>IR ( $\text{cm}^{-1}$ ) : 3430, 3290, 1680       |
|    | A-66         | Appearance: Light yellow liquid<br>IR ( $\text{cm}^{-1}$ ) : 3440, 3300, 1680  |

TABLE 2 (Continued)

| Compound No. | Physicochemical Characteristics   |
|--------------|---|
| A-67         | Appearance: Colorless crystal<br>m.p. (°C) : 134-135<br>IR (cm <sup>-1</sup> ) : 3400, 3230, 1670       |
| A-68         | Appearance: Light yellow liquid<br>: IR (cm <sup>-1</sup> ) : 3450, 3300, 1675                          |
| A-69         | Appearance: Light brown crystal<br>m.p. (°C) : 66-68<br>IR (cm <sup>-1</sup> ) : 3445, 3160, 1690       |
| A-70         | Appearance: Light yellow crystal<br>m.p. (°C) : 106-108<br>IR (cm <sup>-1</sup> ) : 3450, 3295, 1680    |
| A-71         | Appearance: Colorless crystal<br>m.p. (°C) : 113-115<br>IR (cm <sup>-1</sup> ) : 3350, 3170, 1695, 1665 |
| A-72         | Appearance: Light brown liquid<br>m.p. (°C) : 94-96<br>IR (cm <sup>-1</sup> ) : 3375, 3300, 1680        |
| A-73         | Appearance: Colorless crystal<br>m.p. (°C) : 117-119<br>IR (cm <sup>-1</sup> ) : 3440, 3180, 1680       |
| A-74         | Appearance: Yellow liquid<br>: IR (cm <sup>-1</sup> ) : 3450, 3290, 1685                                |
| A-75         | Appearance: Light brown liquid<br>: IR (cm <sup>-1</sup> ) : 3450, 3300, 1670                           |
| A-76         | Appearance: Colorless crystal<br>m.p. (°C) : 102-104<br>IR (cm <sup>-1</sup> ) : 3400, 3290, 1670       |
| A-77         | Appearance: Brown liquid<br>: IR (cm <sup>-1</sup> ) : 3440, 3310, 1670                                 |

TABLE 2 (Continued)

| 5  | Compound No. | Physicochemical Characteristics  |
|----|--------------|--|
| 10 | A-78         | Appearance: Light brown crystal<br>m.p. (°C) : 79-81<br>IR (cm <sup>-1</sup> ) : 3450, 3295, 1675    |
| 15 | A-79         | Appearance: Light yellow crystal<br>m.p. (°C) : 128-130<br>IR (cm <sup>-1</sup> ) : 3475, 3325, 1670 |
| 20 | A-80         | Appearance: Light yellow liquid<br>: 3450, 3250, 1680  |
| 25 | A-81         | Appearance: Light yellow liquid<br>: 3460, 3270, 1680  |
| 30 | A-82         | Appearance: Light brown liquid<br>: 3450, 3270, 1685   |
| 35 | A-83         | Appearance: Gray crystal<br>m.p. (°C) : 178-180<br>IR (cm <sup>-1</sup> ) : 3430, 3140, 1650         |
| 40 | A-84         | Appearance: Light brown crystal<br>m.p. (°C) : 114-116<br>IR (cm <sup>-1</sup> ) : 3470, 3300, 1670  |
| 45 | A-85         | Appearance: Light brown liquid<br>: 3450, 3270, 1680   |
|    | A-86         | Appearance: Colorless crystal<br>m.p. (°C) : 114-116<br>IR (cm <sup>-1</sup> ) : 3450, 3300, 1670    |
|    | A-87         | Appearance: Light brown liquid<br>: 3450, 3275, 1690   |

50 As ergosterol biosynthesis-inhibitive type fungicidal compounds among Group B compounds, azole type fungicidal compounds, such as Triadimefon (by ISO (International Organization for Standardization) nomenclature, hereinafter the same), Triadimenol, Triflumizole, Propiconazole, Prochloraz, Pefurazoate, Flusilazole, Ipcnazole, Metoconazole and the like are given. N-(3,5-dichlorophenyl)carboximide fungicidal compounds, such as Iprodione, Procymidone and Vinclozolin are given as the carboximide fungicidal compounds. Given as preferable examples of benzimidazole fungicidal compounds are Benomyl, Thiophanate, Thiophanate methyl, Carbendazim, Fuberidazol, Cypendazole, Thiabendazole and the like. Preferable examples of carbamate fungicidal compounds include Diethofencarb and the like.

55 The fungicidal composition for agriculture and horticulture of the present invention can be prepared by simply blending a group A compound and a group B compound. The fungicidal composition of the present in-

vention also can be prepared by blending a formulation containing a group A compound and a formulation containing a group B compound. It is, however, desirable to use a formulation of powder, wettable agent, granule, emulsion concentrate or the like, which contains at least one group A compound and at least one group B compound together with formulation adjuvants. The amount of compounds contained in such a preparation is 0.1 to 95% by weight, preferably 0.5 to 90% by weight, and more preferably 2 to 70% by weight, for both the group A compound and the group B compound.

5 Formulation adjuvants which can be used include carriers, diluents and surfactants. Given as specific examples are solid carriers such as talc, kaolin, bentonite, diatomaceous earth, white carbon and clay; and liquid diluents such as water, xylene, toluene, chlorobenzene, cyclohexane, cyclohexanone, dimethylsulfoxide, 10 dimethylformamide, and alcohol. Various surfactants may be used depending on the effects intended. Examples include emulsifiers such as polyoxyethylene alkylaryl ether and polyoxyethylene sorbitan monolaurate; dispersants such as lignin sulfonate and dibutylnaphthalene sulfonate; and wetting agents such as alkyl sulfonate and alkylphenyl sulfonate.

15 The above-mentioned formulations include those used as are and those used after diluted with water or the like to a prescribed concentration. When used after dilution, the concentration of the effective components of the present invention is preferably in the range of 0.001 to 1.0% by weight.

16 The effective components of the present invention can be used in combination with other active ingredients such as, for example, bactericides, insecticides, acaricides and herbicides.

20 According to the present invention, the combined use of at least one derivative of 1,5-diphenyl-1H-1,2,4-triazole-3-carboxamide represented by formula (I) and at least one fungicidal compound selected from the group consisting of ergosterol biosynthesis-inhibitive type compounds, carboximide compounds, benzimidazole compounds and carbamate compounds exhibits a superior synergistic effect. This synergistic effect ensures reduction in the amount of the drugs to be used and enables the composition of the present invention useful as a fungicide composition for agriculture and horticulture, particularly for combating the gray mold 25 disease.

26 Other features of the invention will become apparent in the course of the following description of the exemplary embodiments which are given for illustration of the invention and are not intended to be limiting thereof.

### 30 EXAMPLES

35 In order to make clear the synergistic effect of a group A compound and a group B compound, an expected degree of attack by disease in test examples below was calculated according to the method proposed by R. S. Colbey (Weed, vol. 15, pp 20-22). Specifically, rating a completely attacked case at 100 and completely controlled case at 0 in evaluating the respective degree of attacks X and Y when a group A compound or a group B compound was used individually, the expected degree of attack (E) for the combined use of the group A compound and the group B compound was calculated according to the following equation (1).

$$E = X \cdot Y / 100 \quad (1)$$

40 The exhibition of the synergistic effect can be evidenced if the degree of attack obtained by the use of the fungicide composition of the present invention, in which the group A compound and the group B compound are mixed, is smaller than the expected degree of attack (E) calculated by the above equation (1).

45 Tests for controlling effect against gray mold were carried out according to the cucumber fruit method (Nobuo TEZUKA, Akira KISO, J. Pesticide Sci., 1, 321-324 (1976)).

50 This test method consists of cutting a washed cucumber fruit into 5 cm pieces, dipping the pieces in a drug solution of a prescribed concentration for 10 minutes, then drying in air, placing them on a plate of PSA medium filled with *Botrytis cinerea*, and measuring the attacked height increased in five days. The rate of attack in the treated area was then determined from the attacked height in the treated area for the attacked height of the untreated area as 100.

55 The characteristics of this method reside in that it is close to the actual field test, it can quickly detect the effect of drugs in a simple manner, and it can quantitatively determine the effects of drugs with ease.

**Formulation Example 1 <Dust>**

|    |                  | parts by weight |
|----|------------------|-----------------|
| 5  | Group A compound | 3               |
|    | Group B compound | 3               |
|    | Clay             | 40              |
| 10 | Talc             | 54              |

The above ingredients were pulverized and mixed to obtain a dust.

**Formulation Example 2 <Wettable Powder>**

|    |                    | parts by weight |
|----|--------------------|-----------------|
| 15 | Group A compound   | 25              |
|    | Group B compound   | 25              |
| 20 | Lignin sulfonate   | 5               |
|    | Alkyl sulfonate    | 3               |
| 25 | Diatomaceous earth | 42              |

The above ingredients were pulverized and mixed to obtain wettable powder.

**Formulation Example 3 <Granules>**

|    |                  | parts by weight |
|----|------------------|-----------------|
| 30 | Group A compound | 5               |
| 35 | Group B compound | 5               |
| 40 | Bentonite        | 38              |
|    | Clay             | 45              |
|    | Lignin sulfonate | 7               |

The above ingredients were mixed and kneaded with the addition of water. The mixture was extruded and then dried to obtain granules.

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## Formulation Example 4 &lt;Emulsion Concentrate&gt;

|    | parts by weight                     |
|----|-------------------------------------|
| 5  | Group A compound                    |
| 10 | Group B compound                    |
|    | Polyoxyethylene alkylaryl ether     |
| 15 | Polyoxyethylenesorbitan monolaurate |
|    | Xylene                              |
|    | 47                                  |

The above ingredients were mixed and dissolved to obtain an emulsion concentrate.

15 Test Example 1

<Test for controlling effect against cucumber gray mold (*Botrytis cinerea* on cucumber)>

20 A cucumber was washed, cut into 5 cm pieces, dipped in a drug solution made by diluting the emulsion prepared in Formulation Example 4 to a prescribed concentration for 10 minutes, and dried in air. The cucumber pieces were then placed on a plate of PSA medium filled with *Botrytis cinerea*. After five days, the increase in the height of the attacked site was measured. The rate of attack in the treated area was determined taking the height of attack in the untreated area as 100. The results are shown in Table 3.

25 In order to make the effect of the present invention clear, the values of expected degree of attack (E) calculated by the Colbey's equation (1) are also given in Table 3.

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TABLE 3

| Compound No. or<br>Compound name  | Concentration<br>(ppm) | Attacked<br>ratio (%) | Expected<br>ratio E (%) |
|-----------------------------------|------------------------|-----------------------|-------------------------|
| Untreated                         | -                      | 100                   | -                       |
| Compound (A-54)                   | 25                     | 58                    |                         |
| Compound (A-67)                   | 25                     | 74                    |                         |
| Compound (A-53)                   | 25                     | 74                    |                         |
| Ipconazole                        | 25                     | 36                    |                         |
| Metoconazole                      | 25                     | 26                    |                         |
| Flusilazole                       | 25                     | 64                    |                         |
| Iprodione                         | 25                     | 45                    |                         |
| Procymidone                       | 25                     | 90                    |                         |
| Compound (A-54)<br>+ Ipconazole   | 25+25                  | 8                     | 21                      |
| Compound (A-54)<br>+ Metoconazole | 25+25                  | 8                     | 15                      |
| Compound (A-54)<br>+ Flusilazole  | 25+25                  | 20                    | 37                      |

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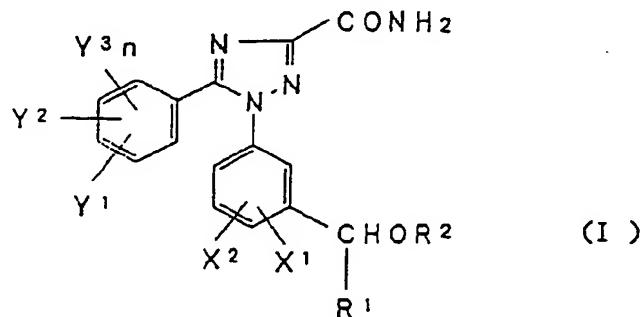
TABLE 3 (Continued)

|    | Compound No. or<br>Compound name  | Concentration<br>(ppm) | Attacked<br>ratio (%) | Expected<br>ratio E (%) |
|----|-----------------------------------|------------------------|-----------------------|-------------------------|
| 5  | Compound (A-54)<br>+ Iprodione    | 25+25                  | 0                     | 26                      |
| 10 | Compound (A-54)<br>+ Procymidone  | 25+25                  | 2                     | 52                      |
| 15 | Compound (A-67)<br>+ Ipconazole   | 25+25                  | 14                    | 27                      |
| 20 | Compound (A-67)<br>+ Metoconazole | 25+25                  | 7                     | 19                      |
| 25 | Compound (A-67)<br>+ Flusilazole  | 25+25                  | 35                    | 48                      |
| 30 | Compound (A-67)<br>+ Iprodione    | 25+25                  | 3                     | 34                      |
| 35 | Compound (A-67)<br>+ Procymidone  | 25+25                  | 5                     | 67                      |
| 40 | Compound (A-53)<br>+ Ipconazole   | 25+25                  | 7                     | 27                      |
| 45 | Compound (A-53)<br>+ Metoconazole | 25+25                  | 6                     | 19                      |
| 50 | Compound (A-53)<br>+ Flusilazole  | 25+25                  | 27                    | 48                      |
| 55 | Compound (A-53)<br>+ Iprodione    | 25+25                  | 3                     | 34                      |
| 60 | Compound (A-53)<br>+ Procymidone  | 25+25                  | 6                     | 67                      |

Obviously, numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.

#### 50 Claims

1. A fungicidal composition for agriculture and horticulture use, which comprises as effective components, at least one derivative of 1,5-diphenyl-1H-1,2,4-triazole-3-carboxamide represented by the following formula (I),



wherein R<sup>1</sup> is a C<sub>1</sub>-C<sub>6</sub> alkyl group, a C<sub>3</sub>-C<sub>6</sub> cycloalkyl group, a C<sub>1</sub>-C<sub>5</sub> fluoroalkyl group, a (C<sub>1</sub>-C<sub>4</sub> alkoxy)methyl group or a phenyl group, R<sup>2</sup> is a C<sub>1</sub>-C<sub>8</sub> alkyl group, a (C<sub>3</sub>-C<sub>6</sub> cycloalkyl)methyl group, a C<sub>2</sub>-C<sub>5</sub> fluoroalkyl group, a (C<sub>1</sub>-C<sub>4</sub> alkoxy)(C<sub>1</sub>-C<sub>4</sub> alkyl) group, a phenyl group, a phenylmethyl group or a phenylmethyl group substituted by a C<sub>1</sub>-C<sub>4</sub> alkyl group or a halogen atom, X<sup>1</sup> represents a hydrogen atom, a C<sub>1</sub>-C<sub>4</sub> alkyl group, a C<sub>1</sub>-C<sub>4</sub> alkoxy group or a halogen atom, X<sup>2</sup> represents a hydrogen atom, a C<sub>1</sub>-C<sub>4</sub> alkyl group or a halogen atom, Y<sup>1</sup> is a hydrogen atom, a halogen atom, a C<sub>1</sub>-C<sub>4</sub> alkyl group, a C<sub>1</sub>-C<sub>4</sub> alkoxy group, a C<sub>1</sub>-C<sub>4</sub> fluoroalkoxy group, a HO group, a HOOC group or a (C<sub>1</sub>-C<sub>4</sub> alkoxy)carbonyl group, Y<sup>2</sup> is a hydrogen atom, a C<sub>1</sub>-C<sub>4</sub> alkyl group or a halogen atom, Y<sup>3</sup> is a hydrogen atom or a halogen atom, and n denotes 1 or 2, and

at least one fungicidal compound selected from the group consisting of ergosterol biosynthesis-inhibitive type compounds, carboximide compounds, benzimidazole compounds and carbamate compounds.

2. The fungicidal composition according to Claim 1, wherein said 1,5-diphenyl-1H-1,2,4-triazole-3-carboxamide is 1-[3-(1-n-butoxy-2-methylpropyl)phenyl-5-(substituted or unsubstituted)phenyl-1,2,4-triazole-3-carboxamide.
3. The fungicidal composition according to Claim 1, wherein the ergosterol biosynthesis-inhibitive type fungicidal compound is a compound selected from the group consisting of Triadimefon, Triadimenol, Triflumizole, Propiconazole, Prochloraz, Pefurazoate, Flusilazole, Ipcnazole and Metconazole.
4. The fungicidal composition according to Claim 1, wherein the carboximide fungicidal compound is a N-(3,5-dichlorophenyl)carboximide fungicidal compound.
5. The fungicidal composition according to Claim 4, wherein the N-(3,5-dichlorophenyl)carboximide fungicidal compound is a compound selected from the group consisting of Iprodione, Procymidone and vinclozolin.
6. The fungicidal composition according to Claim 1, wherein the benzimidazole fungicidal compound is a compound selected from the group consisting of Benomyl, Thiophanate, Thiophanate methyl, Carbendazim, Fuberidazol, Cypendazole and Thiabendazole.
7. The fungicidal composition according to Claim 1, wherein the carbamate fungicidal compound is Diethofencarb.
8. The fungicidal composition according to Claim 1, which an agent combating the gray mold disease.

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European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number  
EP 93 12 0661

| DOCUMENTS CONSIDERED TO BE RELEVANT  |   |  |   |
|--|---|--|---|
| Category   | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim  | CLASSIFICATION OF THE APPLICATION (Int.Cl.5)  |
| A  | EP-A-0 427 695 (MONSANTO COMPANY)<br>---                                      |  | A01N43/653<br>//(A01N43/653,<br>43:653,47:38,<br>55:00,37:32,<br>47:20,47:34,<br>47:18,43:52,<br>43:78,47:20) |
| A  | EP-A-0 182 740 (CIBA-GEIGY AG)<br>---   |  |   |
| P,A  | EP-A-0 522 558 (KUREHA CHEMICAL INDUSTRY CO., LTD.)<br>-----                  |  |   |
| The present search report has been drawn up for all claims   |   |  |   |
| Place of search  | Date of completion of the search  | Examiner   |   |
| THE HAGUE  | 23 March 1994   | Donovan, T   |   |
| CATEGORY OF CITED DOCUMENTS  |   | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or<br>after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>-----           & : member of the same patent family, corresponding<br>document |   |
| X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another<br>document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |   |  |   |

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